US Army Corps of Engineers®
Engineer Research and Development Center

# Tidal Datum for Dredging

## Objective

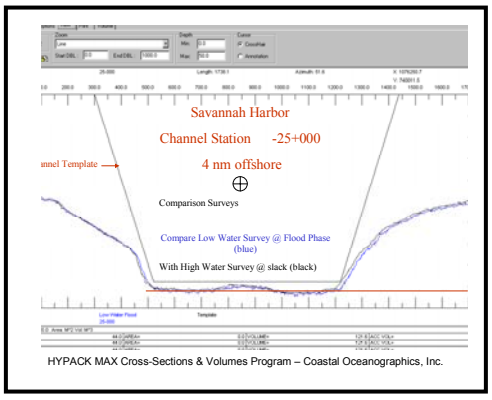
Develop tidal and river datums in approach channels, harbors, and upland rivers using GPS in support of the U.S. Army Corps of Engineers (USACE) Navigation Mission.

## Background

Tide datums, or models of tide behavior across a specific body of water, are normally based on a time series of gauge measurements recorded at fixed structures. Therefore, the models have less accuracy in areas where fixed platforms are not available, such as channel approaches to harbors or the middle of bays and estuaries. However, the development of Real Time Kinematic (RTK) GPS, which provides high accuracy in three dimensions, enables tide measurements on vessels, which results in more accurate vertical locations for dredging or navigation.

## Description

A plan for the GPS Tides System is developed by combining historic conventional tide gauge information with locations selected for GPS Tides measurements. Once executed, measurements are taken every second, twenty-four hours per day, seven days a week, for one month at each required location. The information is compiled and verified by the National Oceanic and Atmospheric Administration (NOAA). The model is then created and stored in the vessel computer to be used during survey or dredging operations.



HYPACK MAX Cross-Sections & Volumes Program – Coastal Oceanographics, Inc.

## Benefits

During survey or dredge operations using GPS Tides, only the vessel personnel are needed, no shoreline support personnel are required for tide staff reading. Start the vessel, go to the project, and begin operations immediately with tide information available every second on the vessel measured at the vessel's actual location. This alone saves at least $200,000 per year per District for floating plant and personnel costs incurred by in-house and dredge contractor hydrographic surveys.

Hydrographic surveys are repeatable time after time for both contractors and government survey vessels using this new system. Dredged volumes are within one percent, saving millions of dollars for USACE Districts and dredge contractors annually. Dredges can also use this system to ensure the proper channel clearance is dredged and verified at the same time.

## Current Status

The USACE Districts currently using the GPS Tides System are Jacksonville, Savannah, and Wilmington. The Charleston District will complete the measurement phase of the system by April 2003 and become operational before FY 2004.

## Point of Contact

Brian Shannon, Brian.F.Shannon@erdc.usace.army.mil, 703-428-6767, Ext. 2478